

**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Petition of West Penn Power Company :  
d/b/a Allegheny Power for Expedited :  
Approval of its Smart Meter Technology :  
Procurement and Installation Plan :**

**Docket No. M-2009-2123951**

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COMMENTS OF  
THE PENNSYLVANIA ASSOCIATION OF  
COMMUNITY ORGANIZATIONS FOR REFORM NOW

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## INTRODUCTION

The Pennsylvania Association of Community Organizations for Reform Now (“ACORN”) respectfully submits these comments pursuant to the Pennsylvania Public Utility Commission’s (“Commission” or “PUC”) Implementation Order. *Smart Meter Procurement and Installation, Implementation Order*, Docket No. M-2009-2092655 (Order entered June 24, 2009) at 4 (“Implementation Order”).

ACORN respectfully submits that Smart Metering technology and the associated dynamic pricing schemes are inappropriate for use with low income, residential utility consumers. These new technologies will lead to increased costs for low income customers with no clear corresponding benefit. Low income customers cannot afford their existing utility bills, as is shown by ever increasing termination levels, much less increased costs from smart meters and dynamic pricing. Even for those low income households that manage to effectuate a reconnection of service after an involuntary service termination, this reconnection often comes at a high price as low income families must shift money from their food, housing, or medical budgets to pay to restore utility service. Low income households simply can not afford increases in utility bills due to smart meter technology. Furthermore, many of the new services associated with smart meter technology – remote reconnection/disconnection, service limitation, and prepayment – place low income families at greater risk of physical harm. Because low income customers will not be able to afford or benefit from smart meter technology, and are likely to be negatively affected and physically endangered by its implementation, ACORN respectfully recommends low income households be made exempt from participation in smart meter plans and be made exempt from any new costs arising from these plans.

## BACKGROUND

Governor Edward Rendell signed Act 129 of 2008 (“the Act” or “Act 129”) into law on October 15, 2008, and the Act took effect on November 14, 2008. The Act, among other things, held that within nine months of its effective date electric distribution companies (“EDCs”) must file for approval with the Commission a smart meter technology procurement and installation plan (“smart meter plan”). 66 Pa.C.S. § 2807(f)(1). Each EDC’s smart meter plan must detail how smart meters will be provided to customers who request a meter, in new construction, and in accordance with a depreciation schedule not to exceed 15 years. *Id.* at §§ 2807(f)(1) and (2). The Act requires EDCs to provide direct meter access to third parties upon customer request. *Id.* at § 2807(f)(3). The Act defines minimum smart meter technology capabilities and describes cost recovery methods. *Id.* at §§ 2807(g) and (f)(7).

On March 30, 2009, the Commission issued a Secretarial Letter seeking comments on a draft staff proposal and additional questions regarding EDC smart meter procurement and installation. *Smart Meter Procurement and Installation Plans*, Docket No. M-2009-2092655 (March 30, 2009). Comments were due by April 15, 2009, and reply comments due April 27, 2009. On April 9, 2009, the comment period was extended to April 20, 2009 and the reply comment period to April 29, 2009.

In June 2009, the Commission issued its Implementation Order outlining the requirements for EDCs’ smart meter plans. *Smart Meter Procurement and Installation Plans, Implementation Order*, Docket No. M-2009-2092655 (Order entered June 24, 2009). The Order included detailed requirements for the plan approval process, for smart meter deployment, for smart meter capabilities, for access to smart meter data, and for cost recovery. Pursuant to the requirements of Act 129 and of the Implementation Order West Penn Power Company submitted

a Smart Meter Procurement and Installation Plan on August 14, 2009. *Petition of West Penn Power Company d/b/a Allegheny Power for Approval of its Smart Meter Procurement and Installation Plan*, Docket No. M-2009-2123951 (Filed August 14, 2009) (“*Petition*”).

### COMMENTS

ACORN respectfully submits that concurrent with the Commission’s review of West Penn Power’s Smart Meter Plan, the Commission should consider several important factors associated with smart meters and dynamic pricing schemes and how these factors impact upon low income households. In particular, the Commission should consider:

- The impact upon low income households of the numerous new charges that will be incurred over the next several months, particularly costs associated with new meters and the telecommunications infrastructure supporting those meters.
- The ability of low income households to actually shift utility usage.
- The ability of low income households to access the information made available by smart meter technology.
- The negative impact upon low income households of several activities associated with or made possible by smart meter technology, including remote disconnection, service limiters, prepay meters and privacy infringement.

ACORN respectfully submits that a candid review of these issues leads to the conclusion that low income households should be made exempt from participation in smart meter activities and should be made exempt from any costs arising from smart meter activities.

In the alternative, should the Commission reject ACORN’s arguments and determine smart meter technology is required for low income households, then the Commission should both

increase the level of consumer protections for low income customers to mitigate its dangers and conduct a significant review of the efforts EDCs will make to educate low income customers about the technology. This new technology is sure to bewilder many residential customers, including low income households. The Commission should require companies to prepare and use appropriate, targeted methods of communication to ensure low income customers can interact with the new smart meter system in an informed manner.

### **Impact of New Charges:**

Low income families are, at best, treading water. Census data illustrates this:

“A new comprehensive economic survey shows that the recession has plunged 2.6 million more Americans into poverty, wiped out the household income gains of an entire decade and pushed the number of people without health insurance up to 46.3 million.”<sup>1</sup>

As income levels have remained the same or declined, the cost of living has increased, particularly energy costs, and low income families, those with income at or below 150% of the federal poverty income guidelines (“FPIG”), are struggling more than ever to make ends meet.

To make this situation more tangible, a family of four with income at 150% FPIG makes \$33,084 annually.<sup>2</sup> Each time additional expenses arise for this family, they are pushed closer to the edge. Unlike more affluent families, this low income family has no room in their budget to absorb new costs, and they do not have any savings or other financial reserves on which to draw to make ends meet; they probably have no health insurance for the adults. Additional costs from smart meter initiatives are too much for this family to bear.

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<sup>1</sup>Carol Morello and Dan Keating, “Millions More Thrust Into Poverty,” *The Washington Post*, September 11, 2009. Retrieved from <http://www.washingtonpost.com/wp-dyn/content/article/2009/09/10/AR2009091001637.html> on Sept. 21, 2009.

<sup>2</sup> See the United States Department of Health and Human Services website for the current federal poverty income guidelines at <http://aspe.hhs.gov/poverty/09poverty.shtml>.

Costs associated with smart meters are only one part of a larger number of new costs related to utility service. The Energy Efficiency and Conservation Plans required by Act 129 will impose new costs on low income households. The impending expiration of generation rate caps will impose additional costs on low income households, costs that are expected to be significant, such as the 30% increases expected for PPL's service territory. It is almost certain that new costs associated with carbon mitigation and global warming are on the horizon and will impose additional costs on low income households. West Penn Power is expecting their Smart Meter Procurement and Installation to cost \$410 million, which will add to the burden on low income households. *Petition* at 13-14. The cumulative effect of these increases will be higher levels of low income terminations because low income budgets simply will not be able to absorb all of these new costs. Because increased levels of low income terminations are such a problem, and because sufficiently expanding low income universal service programs, such as CAP, to adequately address low income affordability needs has not been achieved, the Commission should take this opportunity to exempt low income households from participating in and paying for smart meter and dynamic pricing programs.

**Shifting Usage:**

Part of the logic of dynamic pricing – time of use pricing and real time pricing – is that households can shift their electricity usage from times of higher electric cost to times when the same amount of electricity costs less. A household that chooses not to shift usage or which cannot shift usage will pay more for electricity under these dynamic pricing schemes. The assumption is that when households are provided with the proper information about pricing (the proper “price signals”), the households will choose to shift usage. However, it remains unclear

whether low income households really will be able to shift electricity usage in a sufficiently meaningful fashion so as to avoid incurring higher electric bills.

Low income households use less electricity than do their more affluent counterparts.<sup>3</sup> This makes sense as low income households cannot afford all of the high-end electronic equipment that often drives higher electricity usage (e.g., large, flat screen television sets; computers with high-speed Internet access, or swimming pool pumps). Also, low income residences tend to be smaller than the homes of more affluent households and take less energy to function. Low income households' usage is driven by essentials – cooking, cleaning, lighting, and heating – usage which generally occurs during the morning and evening hours when family members are at home. It seems unlikely this usage can be shifted significantly or reduced such that low income families can meaningfully participate in dynamic pricing schemes in a fashion that allows them to reduce their electric bills.

Because it is unlikely low income households will be able to shift electricity usage in a sufficiently meaningful fashion so as to avoid higher electric bills, the Commission should exempt these households from participating in smart meter and dynamic pricing programs.

**Accessing Information:**

Smart meters are useful for consumers only insofar as the information they provide about pricing and usage can be accessed easily. It is with this information that consumers can best gauge when and how much electricity to use and for what purposes. It goes without saying, then, that consumers who cannot easily access this information will be at a serious disadvantage. Low income consumers are in this situation of being unable to easily access information.

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<sup>3</sup> See the attached Report by Roger Colton, "Home Energy Consumption and Expenditures by Income," for substantiation of this position.

There are two principal ways in which information can be distributed from smart meters to consumers: through in home displays or through the Internet. Both of these options present difficulties for low income households. In home displays are basically small electronic interfaces provided to customers by the utility with which the customer can access rate and usage information. Unfortunately, the cost of these displays is absorbed by ratepayers. As was explained earlier, low income households have no room in their budgets for any increased costs, like those for in home displays. The second option, Internet access, is equally problematic because low income households exhibit less access to home computers with Internet than do more affluent households.<sup>4</sup> More likely, these homes use their local library to access the Internet. And in some places, like Philadelphia, where budget problems have led to proposals to shut down neighborhood libraries, even these resources are not assured. Thus, gaining reliable access to the essential pricing information they require will be particularly difficult for low income households. This absence of readily available information will undermine low income households' ability to robustly participate in dynamic pricing schemes.

Because low income households will face unique and perhaps insurmountable problems accessing important pricing information, the Commission should exempt low income households from participating in smart meter and dynamic pricing programs.

**Remote Disconnection/Reconnection:**

Remote disconnection and reconnection capability has been designated by the Commission as a required capability for EDCs' smart meter technology. Implementation Order at 16. Remote disconnection and reconnection capability empowers the EDC to connect and

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<sup>4</sup> See "Falling Through the Net: Defining the Digital Divide." Report by the National Telecommunications and Information Administration. Retrieved from [www.ntia.doc.gov/ntiahome/ftn99/part1.html](http://www.ntia.doc.gov/ntiahome/ftn99/part1.html) on 9/23/09.

disconnect service from a location other than from the residence and its meter, rather than having utility personnel physically visit the residence and meter to effectuate a connection or disconnection. This is a significant change in Commission policy and, unless adequate protections are incorporated, will throw into question and conflict with current consumer protections. For example, Chapter 14, although it strips away many important consumer protections, continues to at least require a physical visit to post the residence where personal notice of termination has not taken place during the winter months. 66 Pa.C.S. § 1406(b)(1)(iii). This change will have negative repercussions for low income customers because they tend to be more likely to suffer involuntary service terminations.

As has been mentioned several times already, low income households work in a much different financial world than do more affluent customers; low income families exist in a world marked by insufficient financial resources with which to deal with basic household needs. An out-of-the-routine occurrence, such as a flat tire or broken down furnace, capable of being dealt with by middle or upper class households, can be a disaster for a low income household and can be the event that leads to hard choices about whether to meet the emergency or to meet other essential needs, such as utility, food, or medical bills. This different financial environment also means low income households may be more likely to face service termination and may be more likely, because of their chronic shortfall of cash, to wait until the last moment to deal with a utility termination notice. Low income households benefit from a visit to the premises by the utility personnel because it gives them one last chance to resolve whatever issue has led to the scheduled termination. Depriving low income households of this opportunity by making the event a remote one is simply making it that much more likely low income households will suffer service termination.

Furthermore, the smart meter plans are part of Act 129, the purpose of which is to help consumers employ energy efficiency and conservation tools to reduce consumption and thereby reduce their electric bills. It is unclear how, or if, remote disconnection and reconnection capability advances this goal and, therefore, whether it is even appropriate to entertain in this proceeding.

In the current environment where so many factors are increasing the levels of service termination, ACORN respectfully suggests the Commission should take this opportunity to reduce the likelihood of low income terminations by exempting low income households from being subject to remote disconnection and reconnection.

**Service Limiters:**

ACORN supports the Commission's decision to omit service limiting functionality from the minimum requirements for smart meters. Implementation Order at 18. While the Commission does not include service limitation as a required basic functionality, the Commission does allow individual EDCs to include the functionality in their systems. *Id.* For EDCs choosing to include this service limitation functionality, Commission approval is required prior to its implementation. *Id.*

ACORN respectfully submits the Commission should not grant approval to implement service limitation for low income customers in any situation. Service limiters are dangerous devices that can lead to tragedies, like the case of a 93-year-old man in Bay City, Michigan, who froze to death last winter after having a service limiter installed in his premises. Low income households and households with elderly, children, or infirm inhabitants are simply too vulnerable for service limiters to be used safely with them. In an imperfect world where utility companies

and their personnel can and do make mistakes, the use of service limiters places human life at too great a peril to be justified by any possible resulting financial benefit.

Furthermore, service limiting functionality violates existing, longstanding Commission regulations prohibiting the interruption of service. Section 56.71 of the 52<sup>nd</sup> Chapter of the Pennsylvania Code allows for the interruption of service in very constrained situations: “A utility may temporarily interrupt service where necessary to effect repairs or maintenance; to eliminate an imminent threat to life, health, safety or substantial property damage; or for reasons of local, State or national emergency.” 52 Pa. Code § 56.71. Service limiters, which limit service under a wide variety of circumstances, will almost certainly conflict with Section 56.71, most likely to the detriment of low income customers.

Because service limiters introduce an unacceptable increase in the possibility of harm to low income customers and very likely will violate existing Commission regulations, ACORN respectfully submits the Commission should not grant approval to implement service limitation for low income customers in any situation.

**Prepay Meters:**

ACORN supports the Commission’s decision to omit prepay functionality from the minimum requirements for smart meters. Implementation Order at 18. While the Commission does not include prepayment as a required basic functionality, the Commission does allow individual EDCs to include the functionality in their systems. *Id.* For EDCs choosing to include this prepayment functionality, Commission approval is required prior to its implementation. *Id.*

ACORN respectfully submits the Commission should not grant approval to implement prepay meters for low income customers in any situation. Prepay meters present a significant

change in Commission policy and, unless adequate protections are incorporated, will throw into question and conflict with consumer protections currently contained in Pennsylvania Code, Title 52, Chapter 56. For example, Commission regulations contain strict rules governing for what types of service prepayment may be requested. 52 Pa. Code § 56.17 (Advance Payments). Importantly, the regulations explicitly exclude low income households, defined as those with income at or below 150% FPIG, from the group from whom prepayment may be requested. *Id.* at § 56.17(3)(i).

Additionally, prepay meters, very much like service limiters, introduce a level of danger to the consumer that is unjustifiable. In a fallible world where mistakes can and do happen, there is simply no justification, financial or otherwise, for employing a technology that will put consumers, particularly low income, elderly, or ill consumers, at a higher risk of incurring physical harm.

Furthermore, the smart meter plans are part of Act 129, an act the purpose of which is to help consumers employ energy efficiency and conservation tools so as to reduce consumption and thereby reduce their electric bills. It is unclear how or if prepayment capability advances this goal and, therefore, whether it is even appropriate to entertain in this proceeding.

Because prepay meters introduce an unacceptable increase in the possibility of harm to low income customers, violate Commission regulation, and have little correlation with energy conservation, ACORN respectfully submits the Commission should not grant approval to implement prepayment functionality for low income customers in any situation.

**Preconditions for Reconnection:**

ACORN respectfully recommends the Commission prohibit the use of any of the aforementioned technologies – remote disconnect/reconnect, service limiting, or prepayment - as a precondition for reconnection.<sup>5</sup> While not directly acknowledged in this proceeding, it is highly likely EDCs may attempt to employ the aforementioned services related to smart meter technology as a precondition for restoring service. For example, where a customer has suffered an involuntary service termination and has insufficient money to effectuate a reconnection, an EDC should not be permitted to offer to reconnect service in exchange for a customer's agreement to use a service limiter. This is simply a covert way of introducing questionable and dangerous service conditions at a time when a customer has little or no choice but to comply. ACORN respectfully submits the Commission should prohibit any EDC offering as a condition for reconnection the implementation of remote disconnect/reconnect, service limitation, or prepayment metering.

**Education and Outreach:**

Should the Commission reject ACORN's recommendations to exempt low income households from all or any of the smart meter and dynamic pricing programs discussed supra, then, in the alternative, ACORN respectfully requests the Commission require EDCs to implement robust educational programs specifically designed for and targeted to low income households.

These educational programs should deal with, at a minimum, the basics of electricity production and distribution, how to use all of the smart metering equipment and displays, how to

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<sup>5</sup> The same argument applies for enrollment or reenrollment into Universal Service Programs. None of the services discussed in these comments should be permitted by the Commission to be used as a condition for enrollment or reenrollment into a Universal Service Program.

understand and benefit from any new rate designs, and where the costs of smart meter infrastructure are being included in the customer's bill. These educational materials should be communicated to low income households using targeted mediums familiar to and used by low income communities. For example, in addition to a broad media campaign, West Penn Power may choose to partner with a local community group to perform trainings and outreach to low income communities.

**Increased Consumer Protections:**

Should the Commission reject ACORN's recommendations to exempt low income households from all or any of the smart meter and dynamic pricing programs discussed supra, then, in the alternative, ACORN respectfully requests the Commission increase the level of consumer protections for low income households.

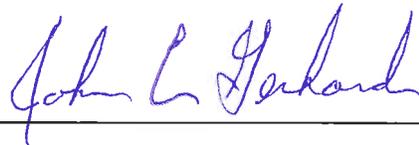
For example, with the passage of Chapter 14, regulated utilities are for the first time permitted to terminate service without physically meeting with the customer. Phone calls are all that is required to constitute notice of termination pursuant to Chapter 14. 66 Pa.C.S. § 1406(b). If, on top of Chapter 14's stripping away of important consumer protections, the Commission allows utilities to remotely disconnect service, then a low income customer may never even see a live human being during the course of a service termination. This is a profound degradation of consumer protection which is sure to lead to significant hardship among low income consumers.

To counteract this effect, the Commission should concurrently effectuate an increase in consumer protections if it determines to allow remote disconnection/reconnection, service limitation, or prepayment metering.

CONCLUSION

In conclusion, ACORN respectfully submits smart metering technology and the associated dynamic pricing schemes are inappropriate for low income households. Low income households can not afford increases in utility bills due to smart meter technology, and the associated programs and service offerings place low income households at an unjustifiable physical risk. ACORN respectfully recommends the Commission should exempt low income households from participation in smart meter plans, from any new costs arising from these plans, and from any new services offered in association with smart metering.

Respectfully submitted,

A handwritten signature in blue ink, reading "John C. Gerhard", is written over a horizontal line.

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**HOME ENERGY CONSUMPTION  
AND EXPENDITURES BY INCOME  
(Pennsylvania)**

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*May 2009*

One question that frequently presents itself today is the extent to which low-income households have higher or lower energy consumption than do higher income households. The question has numerous implications:

- Do rate designs with higher fixed costs help or harm low-income customers?
- Do energy efficiency investments adequately reach low-income customers?
- Do low-income customers have disproportionately high energy consumption that can be controlled through technology such as “smart meters,” prepayment meters, or service limiter adapters?

The analysis presented below examines energy usage and expenditures for Pennsylvania by income. The analysis focuses on three types of home energy use:

1. Natural gas used for space heating;
2. Electricity used for space heating;<sup>1</sup> and
3. Electricity used for non-space heating.<sup>2</sup>

Based on national, regional and state-specific data, the analysis below concludes that a direct relationship exists between income and home energy consumption. As income increases, home energy usage and expenditures increase as well.<sup>3</sup>

## **I. PENNSYLVANIA-SPECIFIC DATA**

While data produced by the U.S. Census Bureau setting forth home energy bills by income level for Pennsylvania does not contain usage data, per se, the data on expenditures nonetheless provides reasonable insights into the relative use of natural gas and electricity by income level.

Pennsylvania data is set forth in Table 1. This Table presents monthly expenditures for natural gas, electricity (space heating), and electricity (non-space heating) as reported in the 2007 American Community Survey, which provides the most recent Census data available.<sup>4</sup> As can be seen, expenditures for all three fuels (treating electricity used for space heating and electricity

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<sup>1</sup> “Electricity used for space heating” includes all electricity expenditures by households using electricity for space heating.

<sup>2</sup> “Electricity used for non-space heating” includes all electricity expenditures by households not using electricity for space heating. The data excludes households reporting the use of “no fuels.”

<sup>3</sup> Throughout this discussion, “home energy” refers respectively to the use of natural gas, the use of electricity by households using electricity for space heating, and the use of electricity by households using space heating fuels other than electricity.

<sup>4</sup> The American Community Survey collects annual data on selected household and housing characteristics in years between the Decennial Census.

used for non-space heating as a separate “fuel” for these purposes) increase as each income tier increases in Pennsylvania.

Monthly natural gas expenditures for households with incomes more than \$250,000 were nearly twice as high as the monthly expenditures for households with incomes less than \$10,000 (\$143.90 vs. \$78.00) in 2007 while the monthly electric space-heating expenditures were more than three times higher (\$241.50 vs. \$70.70). So, too, did the monthly expenditures for electric non-space heating for households at the highest income range exceed electric non-space heating expenditures at the lowest range by nearly 300% (\$195.20 vs. \$66.70).

Indeed, the median income in Pennsylvania in 2007 was \$48,576. For median income, we find:

- The monthly natural gas expenditure for the income range encompassing that median income (\$40,000 - \$50,000) was \$109.50, nearly 40% higher than expenditures for households with incomes less than \$10,000 (the lowest income level) (\$78.00), but only 74% of expenditures for households with income greater than \$250,000 (the highest income level) (\$143.90).
- The monthly electric space heating expenditure for the income range encompassing median income was \$126.30, nearly 80% higher than expenditures for households with income less than \$10,000 (\$70.70), but half of the expenditures by households with income greater than \$250,000 (\$241.50).
- The monthly electric non-space heating expenditures was \$92.30, nearly 40% higher than expenditures by households with income less than \$10,000 (\$66.70), but only half of the expenditures by households with income greater than \$250,000 (\$195.20).

Figure 1 presents the same data graphically. The graphic presentation of the data reveals in clear terms the continuous increase in home energy consumption as household income increases for all three fuels.

The conclusions reached above do not change if the income status of households is measured by reference to income in terms of a ratio to Federal Poverty Level (FPL) rather than in dollar terms. Poverty Level is a measure of income taking into account household size. Poverty Level recognizes, for example, that a three-person household with an income of \$10,000 is “poorer” than a two-person household with an income of \$10,000.

Overlaying household size onto income by considering the Federal Poverty Level of a household does not change the results of the inquiry in Pennsylvania. Table 2 presents monthly home energy bills for Pennsylvania by increasing levels of the Federal Poverty Level. In Pennsylvania, the monthly home energy expenditure at 300% of Poverty or more is:

- 144% of the natural gas expenditures for households with incomes below 50% of Federal Poverty Level;

- 177% of the electric space heating for households with incomes below 50% of Federal Poverty Level; and
- 139% of the electric non-space heating for households with incomes below 50% of Federal Poverty Level.

#### CONSISTENCY WITH NON-STATE-SPECIFIC DATA

Other empirical analysis supports this finding that a relationship exists between income and home energy expenditures. The U.S. Department of Energy, Energy Information Administration (“DOE/EIA”) publishes regular periodic reports based on data from its triennial Residential Energy Consumption Survey (“RECS”). In June 2001, DOE/EIA released its analysis of RECS data titled *Natural Gas Use in American Households*. In the section of its analysis that examines the relationship between income and natural gas usage, DOE/EIA states:

The use of natural gas for any end use and as the main heating fuel was approximately the same regardless of household income category. In contrast, natural gas consumption and expenditures per household did vary by household income—higher income households consumed more and spent more on average. Higher income households lived in larger housing units, which require more energy for heating.<sup>5</sup>

#### INCOME AND THE SIZE OF HOUSING UNITS

The Department of Energy’s observation that “higher income households live in larger housing units, which require more energy for heating” applies to Pennsylvania as well as to the country as a whole.

Table 3 presents Pennsylvania data on home energy expenditures by income and housing unit size. In Table 3, the size of the housing unit is measured in terms of the number of bedrooms. As can be seen from Table 3, the difference in the average expenditures by income is far greater than the difference in expenditures by income within any given housing unit size. This is because the distribution of households by housing unit size is not similar between income ranges<sup>6</sup>. While there may be somewhat of a distinction between a higher-income household in a four-bedroom housing unit and a lower-income household in a four-bedroom housing unit, because there are far fewer lower-income households in four-bedroom units, the overall difference in expenditures is much greater.

The same impacts can be seen in Table 4. This data also presents the distribution of home energy expenditures by housing unit size. In Table 4, housing unit size is measured in terms of the total number of rooms (not merely the number of bedrooms). The same relationship is

<sup>5</sup> EIA/DOE, *Natural Gas Use in American Households*, Household Income, at text accompanying Figures 1 – 3 (June 2001).

<sup>6</sup> See, Table 5 and Table 6, *infra*, and accompanying text.

evident as was shown above. The average home energy expenditure in Pennsylvania varies sharply by income. As is the case with the number of bedrooms, the reason for this is that the higher-income households live in larger housing units.

### *Average Income and Housing Unit Size*

This conclusion that higher income Pennsylvania households live in larger housing units is based on two different data-based observations. First, Table 5 presents the average income in Pennsylvania by the number of *rooms* in a housing structure, as well as the average income in Pennsylvania by the number of *bedrooms* in a housing structure. Table 5 clearly shows that as average income increases, housing structures get larger in Pennsylvania.

There are two standard ways to measure the size of a housing unit. One way is to look at the number of total rooms. The other way is to look at the number of bedrooms. Both of these approaches document that smaller sized units have lower-income households. For example, while the average income of a Pennsylvania household living in a unit with one room is \$20,929, the average income of a household living in a unit with nine or more rooms is \$148,268.

The same relationship holds true for housing size measured by the number of bedrooms. While the average income for a Pennsylvania household living in a unit with one bedroom is \$31,285, the average income of a household living in a housing unit with five or more bedrooms is \$156,324.

Whether the size of the housing unit is measured in terms of the number of rooms, or in terms of the number of bedrooms, the average income progressively increases as the size of the housing unit increases.

### *Distribution of Housing Unit Size by Income*

The same results can be derived by examining the relationship between housing unit size (whether in terms of number of bedrooms or in terms of total number of rooms) and the income of households living in such units. Consider Table 6, which presents a distribution (rather than an average) of Pennsylvania households by the size of the housing unit in which they live, separately examining the size of the housing unit measured by the number of rooms and the number of bedrooms.

The data shows that a higher proportion of lower-income households live in smaller housing units. For example, while 48% of households with incomes less than \$10,000 live in units with two bedrooms or less, only 5% of households with income greater than \$250,000 (and only 6% of households with incomes between \$150,000 and \$250,000) live in units that small. Conversely, while 77% of households with incomes of \$250,000 or more live in units with four or more bedrooms (and 64% of households with incomes between \$150,000 and \$250,000 do), only 12% of households with incomes below \$10,000 live in units that large (and only 13% of households with incomes between \$10,000 and \$20,000 do).

The same observations can be made about the relationship of income and housing unit size measured in terms of the number of rooms (not merely number of bedrooms). While 80% of Pennsylvania households with incomes greater than \$250,000 live in housing units with eight or more rooms (and 66% of households with incomes between \$150,000 and \$250,000 do), only 9% of households with incomes less than \$10,000 do (identical to the 9% of households with incomes between \$10,000 and \$20,000 that do).

### ***Income and Building Type***

Others ways exist through which to gain insights into the relationship between housing unit size and income. One of the implications of housing unit size documented above is a difference in housing unit *type* as well. One extension of the observation that low-income households live in smaller housing units is the further observation that low-income households tend to live in smaller, denser housing units as well.

Examining the relationship between income and the type of building in which customers have their housing units helps to determine whether this is accurate for Pennsylvania. Building type is disaggregated by the type of construction (single family, multi-family, mobile home) and the number of units in each building.

Table 7 shows that residents of multi-family housing units are significantly disproportionately over-represented by low-income households. While 31% of households with incomes less than \$10,000 live in building units with three or more units, and 22% of households with incomes between \$10,000 and \$20,000 do, fewer than 3% of households with incomes of \$150,000 or more live in buildings with three or more units. Conversely, while between 86% and 90% of households with incomes \$150,000 or higher live in single family detached homes, only 29% of households with incomes less than \$10,000 do (and only 39% of households with incomes between \$10,000 and \$20,000 do).

This data supports the conclusion that low-income households have lower home energy consumption in two ways. Table 8 presents home energy expenditures data broken down by building type and income for Pennsylvania.

- Holding building *type* constant, it is possible to see the increase in natural gas expenditures as income increases. For example, in single family detached homes, natural gas expenditures increase from \$115.50 for households with incomes less than \$10,000 living in single-family detached homes to \$131.70 for households with incomes between \$150,000 and \$250,000 (and \$152.20 for households with incomes greater than \$250,000). The same relationship holds for electricity space-heating expenditures (\$173 to \$271.70) as well as for electricity non-space-heating expenditures (\$87.20 to \$214.70).
- Conversely, holding income constant, it is possible to see the decrease in natural gas expenditures as the type of building unit changes (with lower expenditures in buildings with multi-units). For households with income between \$20,000 and \$30,000, for example, natural gas expenditures decreased from \$125.40 in single-family detached

homes to \$29.90 in multi-family buildings with 50 or more units. Again, the same relationship holds for electricity space-heating (\$158.70 to \$42.70) and electricity for non-space heating (\$93.10 to \$36.50).

The conclusion can be drawn that comprehensive Pennsylvania-specific information shows two relationships. First, low-income households tend to live in smaller housing units. Second, smaller housing units tend to have lower home energy (natural gas, electric space-heating, electric non-space-heating) consumption. As a result, the home consumption of low-income households is, on average, lower than the home energy consumption of higher income households.

### **Federal Regional Data**

The relationships identified in the Pennsylvania-specific data are consistent with other regional data reported by the federal government. The U.S. Department of Labor (“DOL”) reports home energy expenditures by region by income. Pennsylvania is in the Northeast regional data reported by the Department of Labor’s Consumer Expenditures Survey (“CEX”).

Table 9 presents the CEX data for the past four years (2006-2007; 2005-2006; 2004-2005; 2003-2004). The CEX data corroborates the state-specific data on the relationship between natural gas and electricity consumption and income.

- In each of the 36 cells (but two: \$30,000 - \$39,999 for 2005/2006 and 2006/2007), the Northeast natural gas expenditures for the higher income tier was more than the natural gas expenditures for the immediately preceding lower-income tiers. Natural gas expenditures for the lowest income tiers (below \$10,000) were roughly one-third the residential average.
- Electricity shows an almost identical pattern. In each of the 36 cells but two (\$5,000 - \$9,999 for 2004/2005 and 2005/2006), the Northeast electricity expenditures for the higher income tier was more than the electricity expenditures for the immediately preceding lower-income tier. Electricity expenditures for the lowest income tier (below \$10,000) were roughly 40% of the residential average.

### **HOUSEHOLD BASIC NEEDS BUDGET**

The fact that lower-income households tend to squeeze all available savings out of their discretionary energy consumption is not surprising. Research shows that low-income households tend to be “good budgeters.” When household income does not provide sufficient resources to cover household necessities, low-income households tend to reduce their expenditures on those necessities.

In this respect, while the unaffordability of home energy in Pennsylvania is driven by the interaction of home energy bills and household income, the overall inadequacy of household income to cover the household’s basic family budget should be taken into account as well. A

basic family budget takes into account the entire range of household expenses, including housing, food, childcare, transportation, health care, necessities and taxes. To the extent that household income is insufficient to cover these basic expenditures, trade-offs must occur in what gets paid and what does not.<sup>7</sup>

A basic family budget varies based on both the household size and the household composition. Not only will a three-person family have a different budget than a two-person family, but also a one-parent/two-child three-person family will have a different basic family budget than a two-parent/one-child three-person family.

Table 10 summarizes the inadequacy of household incomes in Pennsylvania.<sup>8</sup> Basic family budgets<sup>9</sup> for four different family configurations were calculated, using different family composition and family size. Within the reported metropolitan areas for Pennsylvania (and a “rural” region), the basic family budget for a one-parent/one-child family ranged from a low of 227% of the Federal Poverty Level (Armstrong County) to a high of 296% of the Poverty Level (Philadelphia). Pennsylvania’s rural areas have a somewhat lower basic family budget than most, but not all, of the metropolitan regions (243% of Poverty Level).

Three-person families, whether configured as one-parent/two-child or two-parent/one-child families, were grouped more closely within the state, but still well-above 200% of Federal Poverty Level. A two-parent/one-child family has a somewhat lower basic family budget in Pennsylvania than a one-parent/two-child family.

Finally, while the absolute dollar amounts of the basic family budget for a two-parent/two-child family are higher than the corresponding budgets for smaller families, the ratio of those incomes to the Federal Poverty Level are lower. Two-parent/2-child families with income at 222% of Poverty Level in Erie and Williamsport along with families at 219% of the Poverty Level in Johnstown and 222% in Sharon are living with an income that would cover the basic family budget. In contrast, it would take these 2-parent/2-child families 246% of Poverty Level to meet their basic family budget in Allentown and 253% of Poverty Level to meet their basic family budget in Pike County.

The detailed calculations underlying this discussion of basic family needs budgets in Pennsylvania are set forth in Appendix A.

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<sup>7</sup> See, e.g., National Energy Assistance Directors Association (2003). 2003 Survey of Energy Assistance Recipients, Apprise, Inc: Princeton (NJ); National Energy Assistance Directors Association (2005). 2005 Survey of Energy Assistance Recipients, Apprise, Inc.: Princeton (NJ) (energy assistance recipients reduce expenditures on food, health care and other essentials in response to unaffordable home energy bills).

<sup>8</sup> These Basic Family Budgets are calculated by the Economic Policy Institute. They are available at EPI’s web site: [www.epi.org](http://www.epi.org).

<sup>9</sup> Unless the context otherwise clearly shows, a “family” and a “household” are considered to be synonymous for purposes of this discussion.

## SUMMARY AND CONCLUSIONS

The data showing a direct relationship between income and home energy consumption in Pennsylvania is compelling. The differences that are evident in the data are not small. Low-income customers have lower usage not only as compared to high-income customers, but also when compared to average customers as well. In addition, the national data is consistent. The national data developed by the U.S. DOE, the regional data developed by the U.S. DOL, and the state-specific data developed by the Census Bureau all find the same relationship. Finally, the data is internally consistent. While DOE reports that income is related to home energy usage because of differences in housing unit sizes, that relationship is confirmed when housing unit size is overlaid on income and home energy expenditures in the Pennsylvania using state-specific data.

## **Data Tables**

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Table 1.  
 Monthly Home Expenditures by Income (Pennsylvania)  
 2007 American Community Survey

	Natural Gas	Electric (Space Heating)	Electric (non-space heating)
\$1-\$10,000	\$78.00	\$70.70	\$66.70
\$10,001 - \$20,000	\$89.10	\$80.20	\$68.10
\$20,001 - \$30,000	\$102.60	\$99.60	\$78.70
\$30,001 - \$40,000	\$107.00	\$113.80	\$86.00
\$40,001 - \$50,000	\$109.50	\$126.30	\$92.30
\$50,001 - \$75,000	\$114.40	\$143.00	\$102.60
\$75,001 - \$150,000	\$117.50	\$171.50	\$121.10
\$150,001 - \$250,000	\$124.90	\$201.10	\$153.40
\$250,000 or more	\$143.90	\$241.50	\$195.20

**Figure 1. Monthly Home Energy Expenditures by Income  
(Pennsylvania 2007)**

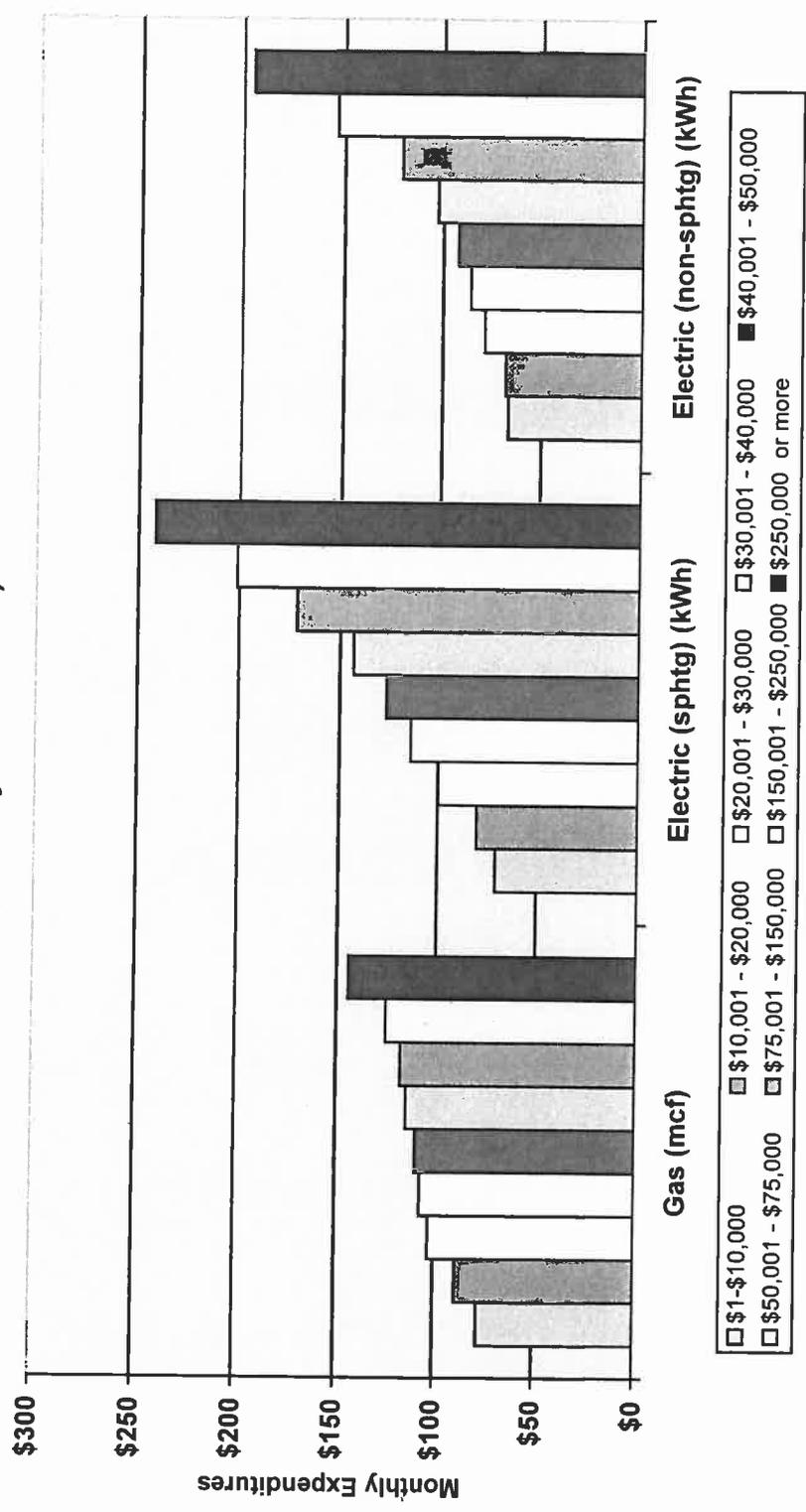


Table 2. Monthly Home Energy Expenditures by Ratio of Income to Federal Poverty Level (Pennsylvania)  
 (American Community Survey: 2007)

	Natural Gas			Electric (space heating)			Electric (non-space heating)		
	Monthly Expenditures	Average Poverty Level within Range	Monthly Expenditures	Average Poverty Level within Range	Monthly Expenditures	Average Poverty Level within Range	Monthly Expenditures	Average Poverty Level within Range	
1 - 50%	\$84.50	27.6%	\$99.00	27.1%	\$89.70	27.7%			
51 - 100%	\$86.00	75.9%	\$102.40	76.1%	\$87.80	76.3%			
101 - 150%	\$92.50	125.7%	\$116.50	125.8%	\$95.20	126.2%			
151 - 200%	\$99.40	176.9%	\$122.20	174.6%	\$102.40	176.8%			
201 - 300%	\$105.90	250.9%	\$141.70	251.1%	\$107.20	251.2%			
301% or more	\$122.10	446.7%	\$175.60	450.3%	\$124.90	445.0%			

Table 3a. Monthly Natural Gas Expenditures by Number of Bedrooms in Home and Income (Pennsylvania)  
(American Community Survey: 2007)

No. of BRms	\$1 - \$10,000	\$10 - \$20,000	\$20 - \$30,000	\$30 - \$40,000	\$40 - \$50,000	\$50 - \$75,000	\$75 - \$150,000	\$150 - \$250,000	\$250,000+
0 bedrooms	\$18.30	\$11.70	\$103.90	\$51.10	\$105.60	--	\$173.40	---	---
1 bedroom	\$37.90	\$45.40	\$45.70	\$49.80	\$50.50	\$45.10	\$57.00	\$17.20	\$37.80
2 bedrooms	\$80.30	\$89.50	\$87.90	\$90.70	\$87.90	\$98.40	\$87.40	\$101.30	\$108.90
3 bedrooms	\$101.20	\$109.00	\$129.00	\$123.10	\$126.80	\$121.00	\$119.90	\$125.50	\$134.10
4 bedrooms	\$125.50	\$126.80	\$122.40	\$161.30	\$133.00	\$146.80	\$124.80	\$130.00	\$142.20
5+ bedrooms	\$85.00	\$129.10	\$118.70	\$166.40	\$167.00	\$162.20	\$172.40	\$151.30	\$166.10
Total	\$86.10	\$95.90	\$109.90	\$116.60	\$117.10	\$122.30	\$121.80	\$129.80	\$145.80

Table 3b. Monthly Electric (space heating) Expenditures by Number of Bedrooms in Home and Income (Pennsylvania)  
(American Community Survey: 2007)

No. of BRms	\$1 - \$10,000	\$10 - \$20,000	\$20 - \$30,000	\$30 - \$40,000	\$40 - \$50,000	\$50 - \$75,000	\$75 - \$150,000	\$150 - \$250,000	\$250,000+
0 bedrooms	\$25.50	\$25.60	\$37.70	\$42.40	\$16.70	\$18.20	\$56.40	\$71.00	---
1 bedroom	\$50.00	\$47.00	\$57.40	\$60.00	\$83.50	\$87.00	\$94.30	\$85.20	\$157.30
2 bedrooms	\$88.70	\$93.90	\$105.70	\$112.10	\$115.40	\$115.90	\$124.90	\$138.40	\$153.80
3 bedrooms	\$126.80	\$139.70	\$148.80	\$156.70	\$150.40	\$171.00	\$185.20	\$194.30	\$191.20
4 bedrooms	\$171.30	\$171.40	\$157.90	\$181.00	\$191.70	\$187.70	\$206.40	\$231.70	\$274.80
5+ bedrooms	\$181.60	\$41.10	\$135.50	\$183.60	\$222.50	\$214.20	\$239.70	\$283.20	\$299.40
Total	\$86.60	\$91.60	\$111.50	\$130.10	\$139.50	\$157.20	\$183.80	\$214.80	\$256.50

Table 3c. Monthly Electric (non-space heating) Expenditures by Number of Bedrooms in Home and Income (Pennsylvania)  
(American Community Survey: 2007)

No. of BRms	\$1 - \$10,000	\$10 - \$20,000	\$20 - \$30,000	\$30 - \$40,000	\$40 - \$50,000	\$50 - \$75,000	\$75 - \$150,000	\$150 - \$250,000	\$250,000+
0 bedrooms	\$24.80	\$27.90	\$32.30	\$59.60	\$93.70	\$27.90	\$57.90	\$20.00	---
1 bedroom	\$41.30	\$51.40	\$53.60	\$58.50	\$61.50	\$67.60	\$76.90	\$111.20	\$75.90
2 bedrooms	\$63.70	\$68.90	\$72.50	\$75.90	\$82.20	\$88.00	\$97.60	\$111.00	\$113.20
3 bedrooms	\$88.70	\$84.60	\$95.70	\$102.50	\$103.00	\$109.10	\$119.90	\$139.60	\$151.20
4 bedrooms	\$104.90	\$90.50	\$113.80	\$113.30	\$120.00	\$137.40	\$147.00	\$177.50	\$214.20
5+ bedrooms	\$115.10	\$95.20	\$106.00	\$111.40	\$155.70	\$138.70	\$151.10	\$196.00	\$244.00
Total	\$77.20	\$76.60	\$88.70	\$96.30	\$102.90	\$112.50	\$129.00	\$165.60	\$207.20

Table 4a. Monthly Natural Gas Expenditures by Number of Rooms in Home and Annual Income (Pennsylvania)  
(American Community Survey: 2007)

No. of Rooms	\$1 - \$10,000	\$10 - \$20,000	\$20 - \$30,000	\$30 - \$40,000	\$40 - \$50,000	\$50 - \$75,000	\$75 - \$150,000	\$150 - \$250,000	\$250,000+
1 room	\$9.70	\$9.60	\$36.10	\$8.90	\$105.60	---	---	---	---
2 room	\$25.90	\$22.80	\$46.30	\$32.10	\$78.90	\$31.30	\$13.50	\$1.00	\$24.80
3 room	\$33.90	\$52.60	\$42.20	\$51.00	\$56.10	\$60.70	\$54.10	\$41.30	\$52.90
4 room	\$71.40	\$74.50	\$76.50	\$75.90	\$72.00	\$78.70	\$73.60	\$98.40	\$45.60
5 room	\$83.20	\$87.30	\$103.80	\$100.80	\$96.50	\$105.50	\$103.80	\$106.70	\$151.40
6 room	\$100.50	\$117.70	\$131.90	\$127.10	\$135.20	\$122.20	\$120.10	\$129.60	\$117.40
7 room	\$118.10	\$126.30	\$119.20	\$128.60	\$126.90	\$125.40	\$125.80	\$111.40	\$138.00
8 room	\$118.90	\$124.10	\$135.00	\$146.70	\$131.90	\$148.00	\$120.70	\$125.70	\$133.50
9 or more	\$160.80	\$127.80	\$127.10	\$177.70	\$140.40	\$152.60	\$138.70	\$143.20	\$156.20
Total	\$86.10	\$95.90	\$109.90	\$116.60	\$117.10	\$122.30	\$121.80	\$129.80	\$145.80

Table 4b. Monthly Electric (space heating) Expenditures by Number of Rooms in Home and Annual Income (Pennsylvania)  
(American Community Survey: 2007)

No. of Rooms	\$1 - \$10,000	\$10 - \$20,000	\$20 - \$30,000	\$30 - \$40,000	\$40 - \$50,000	\$50 - \$75,000	\$75 - \$150,000	\$150 - \$250,000	\$250,000+
1 room	\$25.30	\$25.90	\$38.50	\$42.40	\$16.70	\$16.90	\$250.00	\$57.60	--
2 room	\$29.40	\$45.70	\$35.60	\$53.60	\$67.40	\$77.90	\$97.00	\$90.00	\$80.00
3 room	\$69.80	\$49.30	\$69.90	\$61.20	\$79.20	\$95.40	\$91.70	\$90.70	\$69.90
4 room	\$70.70	\$83.90	\$88.50	\$90.20	\$111.60	\$108.50	\$120.50	\$122.70	\$93.50
5 room	\$83.50	\$121.00	\$128.30	\$148.10	\$138.00	\$142.20	\$149.10	\$156.50	\$200.80
6 room	\$156.00	\$141.00	\$151.20	\$150.40	\$163.40	\$161.00	\$172.50	\$226.50	\$171.40
7 room	\$148.30	\$143.20	\$163.80	\$185.70	\$143.50	\$183.80	\$195.80	\$196.40	\$228.00
8 room	\$165.70	\$166.40	\$177.70	\$151.80	\$194.10	\$193.50	\$201.50	\$218.60	\$245.40
9 or more	\$208.00	\$187.50	\$126.30	\$206.40	\$145.10	\$188.40	\$220.80	\$251.00	\$288.40
Total	\$86.60	\$91.60	\$111.50	\$130.10	\$139.50	\$157.20	\$183.80	\$214.80	\$256.50

Table 4c. Monthly Electric (non-space heating) Expenditures by Number of Rooms in Home and Annual Income (Pennsylvania)  
(American Community Survey: 2007)

No. of Rooms	\$1 - \$10,000	\$10 - \$20,000	\$20 - \$30,000	\$30 - \$40,000	\$40 - \$50,000	\$50 - \$75,000	\$75 - \$150,000	\$150 - \$250,000	\$250,000+
1 room	\$13.10	\$29.50	\$30.50	\$13.80	\$57.30	\$17.50	\$30.00	\$20.00	---
2 room	\$37.30	\$53.90	\$55.10	\$53.20	\$52.80	\$70.10	\$51.80	\$201.00	\$83.00
3 room	\$40.20	\$52.40	\$51.90	\$58.90	\$67.20	\$74.10	\$91.00	\$71.70	\$44.70
4 room	\$60.40	\$68.50	\$69.90	\$72.60	\$81.20	\$91.50	\$90.20	\$82.00	\$104.90
5 room	\$73.60	\$71.30	\$78.50	\$87.10	\$92.60	\$102.60	\$109.10	\$117.20	\$130.80
6 room	\$90.20	\$85.80	\$96.60	\$99.70	\$96.10	\$105.30	\$116.00	\$129.30	\$132.10
7 room	\$98.70	\$80.40	\$98.30	\$104.60	\$109.30	\$117.70	\$126.30	\$155.40	\$173.70
8 room	\$110.30	\$101.10	\$108.10	\$120.10	\$130.00	\$122.50	\$137.30	\$157.70	\$179.60
9 or more	\$115.50	\$100.40	\$125.30	\$115.60	\$136.20	\$141.40	\$154.20	\$191.60	\$233.30
Total	\$77.20	\$76.60	\$88.70	\$96.30	\$102.90	\$112.50	\$129.00	\$165.60	\$207.20

Table 5. Average Income by Number of Rooms or Bedrooms in Housing Unit (Pennsylvania)  
(American Community Survey: 2007)

Number of Rooms/Bedrooms	Average Income by Number of Rooms/Bedrooms	
	Rooms	Bedrooms
0	xxx	\$25,286
1	\$20,929	\$31,285
2	\$30,377	\$50,919
3	\$36,671	\$72,878
4	\$42,454	\$120,742
5 /a/	\$56,074	\$156,324
6	\$68,710	
7	\$85,791	
8	\$108,054	
9 /b/	\$148,268	
Total	\$74,925	\$74,925

NOTES:

/a/ For bedrooms, data is reported for 5 or more.

/b/ For rooms, data is reported for 9 or more.

Table 6. Distribution of Pennsylvania Housing Units by Income and Housing Unit Size (Bedrooms and Rooms)  
(American Community Survey: 2007)

	\$1 - \$10,000	\$10 - \$20,000	\$20 - \$30,000	\$30 - \$40,000	\$40 - \$50,000	\$50 - \$75,000	\$75 - \$150,000	\$150 - \$250,000	\$250,000 or more
Bedrooms	3%	1%	1%	0%	0%	0%	0%	0%	0%
No bedroom	18%	16%	10%	6%	5%	3%	1%	1%	1%
1 Bedroom	27%	30%	29%	25%	22%	17%	9%	5%	4%
2 Bedrooms	40%	40%	46%	50%	52%	54%	50%	30%	19%
3 Bedrooms	8%	10%	11%	14%	17%	20%	33%	48%	48%
4 Bedrooms	4%	3%	3%	4%	5%	5%	7%	16%	29%
5 or more bedrooms	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total BDS									
Rooms	2%	1%	0%	0%	0%	0%	0%	0%	0%
1 Room	4%	3%	2%	1%	1%	0%	0%	0%	0%
2 Rooms	13%	11%	7%	4%	3%	2%	1%	1%	0%
3 Rooms	20%	18%	16%	13%	11%	7%	3%	1%	1%
4 Rooms	19%	24%	21%	21%	20%	16%	10%	5%	4%
5 Rooms	20%	25%	27%	29%	28%	28%	22%	11%	6%
6 Rooms	11%	10%	14%	15%	17%	21%	23%	16%	8%
7 Rooms	4%	5%	7%	9%	11%	14%	20%	24%	17%
8 Rooms	5%	4%	5%	7%	8%	11%	20%	42%	63%
9 Or More Rooms	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total RMS									

Table 7. Percentage of Households by Housing Unit Type (Pennsylvania) (American Community Survey: 2007)

Building Type	\$1 - \$10,000	\$10 - \$20,000	\$20 - \$30,000	\$30 - \$40,000	\$40 - \$50,000	\$50 - \$75,000	\$75 - \$150,000	\$150- \$250,000	\$250,000 or more
Mobile home	6%	7%	7%	6%	5%	3%	1%	1%	0%
1-family detached	29%	39%	49%	56%	61%	68%	78%	86%	90%
1-family attached	28%	23%	22%	20%	21%	19%	16%	10%	7%
2 apartments	7%	8%	6%	5%	4%	3%	1%	0%	0%
3 - 4 units	8%	6%	5%	4%	3%	2%	1%	0%	1%
5 - 9 units	7%	5%	4%	3%	2%	2%	1%	1%	0%
10 - 19 units	5%	3%	3%	2%	2%	1%	1%	1%	0%
20 - 49 units	4%	3%	2%	1%	1%	1%	0%	0%	0%
50 or more units	7%	5%	2%	2%	1%	1%	1%	1%	1%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 8. Home Energy Bills by Income and Housing Type (Pennsylvania)  
(American Community Survey 2007)

Building Type	\$1 - \$10,000	\$10 - \$20,000	\$20 - \$30,000	\$30 - \$40,000	\$40 - \$50,000	\$50 - \$75,000	\$75 - \$150,000	\$150- \$250,000 or more
<b>Natural Gas Bill</b>								
Mobile home	\$73.70	\$94.50	\$94.90	\$87.20	\$87.10	\$89.50	\$96.70	\$150- \$250,000 or more
1-family detached	\$115.50	\$118.50	\$125.40	\$129.80	\$132.00	\$132.40	\$126.20	\$200.00
1-family attached	\$102.00	\$111.90	\$128.40	\$127.70	\$114.60	\$123.10	\$117.00	\$131.70
2 apartments	\$76.30	\$88.80	\$73.90	\$109.00	\$99.90	\$103.50	\$136.90	\$127.90
3 - 4 units	\$59.70	\$51.30	\$64.80	\$52.90	\$70.70	\$68.00	\$121.60	\$89.10
5 - 9 units	\$38.10	\$26.70	\$46.40	\$45.50	\$34.00	\$46.70	\$43.40	\$31.90
10 - 19 units	\$17.70	\$32.40	\$36.10	\$34.40	\$42.30	\$39.10	\$32.40	\$50.20
20 - 49 units	\$15.40	\$17.20	\$29.30	\$34.20	\$15.90	\$16.70	\$36.80	\$31.70
50 or more units	\$13.70	\$3.30	\$29.90	\$17.00	\$12.20	\$24.20	\$23.80	\$66.30
Total	\$86.10	\$95.90	\$109.90	\$116.60	\$117.10	\$122.30	\$121.80	\$21.00
								\$145.80
<b>Electric (space heating) Bill</b>								
Building Type	\$1 - \$10,000	\$10 - \$20,000	\$20 - \$30,000	\$30 - \$40,000	\$40 - \$50,000	\$50 - \$75,000	\$75 - \$150,000	\$150- \$250,000 or more
Mobile home	\$147.10	\$135.70	\$123.50	\$135.80	\$121.20	\$184.20	\$154.10	\$250,000
1-family detached	\$173.00	\$160.30	\$158.70	\$172.30	\$173.50	\$179.40	\$196.40	\$175.80
1-family attached	\$103.40	\$113.90	\$112.60	\$141.10	\$122.60	\$142.80	\$173.00	\$228.20
2 apartments	\$68.50	\$89.50	\$86.80	\$91.60	\$120.00	\$127.30	\$109.20	\$194.80
3 - 4 units	\$77.00	\$86.30	\$95.30	\$116.10	\$113.10	\$124.60	\$110.70	\$160.00
5 - 9 units	\$75.30	\$68.90	\$87.70	\$81.80	\$99.50	\$102.60	\$135.70	\$215.30
10 - 19 units	\$102.30	\$62.50	\$74.80	\$82.00	\$70.90	\$96.70	\$120.80	\$112.60
20 - 49 units	\$43.30	\$43.20	\$37.70	\$54.00	\$60.10	\$84.10	\$114.40	\$139.20
50 or more units	\$30.70	\$26.40	\$42.70	\$39.90	\$66.50	\$73.70	\$79.20	\$48.50
Total	\$86.60	\$91.60	\$111.50	\$130.10	\$139.50	\$157.20	\$183.80	\$107.20
								\$214.80
								\$250,000 or more
<b>Electric (non-space heating) Bill</b>								
Building Type	\$1 - \$10,000	\$10 - \$20,000	\$20 - \$30,000	\$30 - \$40,000	\$40 - \$50,000	\$50 - \$75,000	\$75 - \$150,000	\$150- \$250,000 or more
Mobile home	\$85.60	\$79.10	\$83.40	\$95.90	\$100.50	\$108.80	\$106.40	\$250,000
1-family detached	\$87.20	\$81.20	\$93.10	\$97.60	\$105.60	\$114.40	\$132.80	\$101.20
1-family attached	\$98.10	\$88.80	\$102.90	\$110.70	\$110.40	\$118.90	\$123.60	\$168.70
2 apartments	\$59.20	\$74.10	\$68.50	\$84.50	\$84.40	\$93.70	\$110.00	\$158.90
3 - 4 units	\$44.00	\$50.80	\$57.90	\$64.70	\$60.60	\$81.30	\$75.50	\$100.30
5 - 9 units	\$38.00	\$40.10	\$56.10	\$59.50	\$69.70	\$71.10	\$65.50	\$105.30
10 - 19 units	\$34.90	\$45.40	\$48.60	\$67.50	\$55.60	\$73.10	\$76.10	\$54.30
20 - 49 units	\$31.30	\$55.20	\$45.50	\$47.30	\$64.10	\$69.00	\$67.90	\$55.90
50 or more units	\$17.10	\$30.50	\$36.50	\$39.10	\$53.80	\$51.50	\$52.70	\$104.90
Total	\$77.20	\$76.60	\$88.70	\$96.30	\$102.90	\$112.50	\$129.00	\$40.50
								\$165.60
								\$250,000 or more
								\$83.20
								\$214.70
								\$132.30
								\$86.00
								\$134.10
								\$96.70
								\$60.00
								\$150.00
								\$93.90
								\$207.20

Table 9. Home Energy Expenditures by Household Income Before Taxes (Northeast)

	Total	Less than \$5,000	\$5,000 - \$9,999	\$10,000 - \$14,999	\$15,000 - \$19,999	\$20,000 - \$29,999	\$30,000 - \$39,999	\$40,000 - \$49,999	\$50,000 - \$69,999	\$70,000 or more
				Natural Gas						
2006 - 2007	\$656	\$217	\$291	\$386	\$554	\$510	\$535	\$647	\$732	\$888
2005 - 2006	\$640	\$278	\$319	\$370	\$576	\$533	\$596	\$645	\$723	\$823
2004 - 2005	\$596	\$242	\$304	\$347	\$522	\$535	\$568	\$602	\$620	\$783
2003 - 2004	\$540	\$167	\$290	\$344	\$478	\$508	\$522	\$549	\$536	\$726
				Electricity						
2006 - 2007	\$1,225	\$467	\$491	\$721	\$820	\$924	\$1,096	\$1,144	\$1,264	\$1,742
2005 - 2006	\$1,139	\$521	\$518	\$662	\$778	\$875	\$968	\$1,101	\$1,221	\$1,623
2004 - 2005	\$1,043	\$479	\$473	\$638	\$683	\$821	\$862	\$1,023	\$1,165	\$1,473
2003 - 2004	\$954	\$360	\$457	\$602	\$676	\$749	\$845	\$948	\$1,092	\$1,341

SOURCE: Table 31, U.S. Department of Labor, Consumer Expenditures Survey (annual)

*Table 10: Basic Family Budget  
in Dollars and Percentage of Federal Poverty Level by Geographic Area  
(Pennsylvania)*

	1 parent/1 child		1 parent/2 children		2 parents/1 child		2 parents/2 children	
	Dollars	FPL /a/	Dollars	FPL	Dollars	FPL	Dollars	FPL
Allentown-Bethlehem-Easton	\$37,124	271%	\$44,992	262%	\$43,198	252%	\$50,697	246%
Altoona	\$32,090	234%	\$40,228	234%	\$38,225	223%	\$45,839	222%
Armstrong County	\$31,027	227%	\$39,419	230%	\$37,420	218%	\$45,016	218%
Erie	\$32,462	237%	\$40,521	236%	\$38,190	222%	\$45,804	222%
Harrisburg-Carlisle	\$35,182	257%	\$42,997	250%	\$41,303	241%	\$48,801	236%
Johnstown	\$31,187	228%	\$39,580	231%	\$37,571	219%	\$45,200	219%
Lancaster	\$34,388	251%	\$42,200	246%	\$39,837	232%	\$47,380	229%
Lebanon	\$34,014	248%	\$41,974	244%	\$39,910	232%	\$47,551	230%
Philadelphia-Camden-Wilmington	\$40,561	296%	\$48,804	284%	\$46,616	271%	\$54,488	264%
Pike County	\$39,132	286%	\$46,899	273%	\$44,866	261%	\$52,267	253%
Pittsburgh	\$33,901	248%	\$41,818	244%	\$39,815	232%	\$47,412	230%
Reading	\$34,735	254%	\$42,631	248%	\$40,242	234%	\$47,867	232%
Rural	\$33,279	243%	\$40,554	236%	\$39,489	230%	\$46,452	225%
Scranton--Wilkes-Barre	\$33,990	248%	\$42,042	245%	\$40,260	234%	\$47,992	232%
Sharon	\$32,038	234%	\$40,167	234%	\$38,166	222%	\$45,761	222%
State College	\$36,994	270%	\$44,943	262%	\$42,830	249%	\$50,408	244%
Williamsport	\$32,141	235%	\$40,248	234%	\$38,249	223%	\$45,841	222%
York-Hanover	\$34,347	251%	\$42,160	246%	\$39,795	232%	\$47,339	229%

NOTES:

/a/ FPL is the ratio of the basic family budget to 100% of the Federal Poverty Level for the particular household size. 100% of Federal Poverty Level in 2007 for a two-person household was \$13,690; for a three-person household was \$17,170; and for a four-person household was \$20,650. Basic family needs budgets were calculated for 2007.  
/b/ Pennsylvania portions of multi-state metropolitan areas.

SOURCE: Economic Policy Institute, Basic Family Budget Calculator.

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# Appendix A

(These Basic Family Budgets are developed through the Basic Family Budget Calculator produced by the Economic Policy Institute, [http://www.epi.org/content/budget\\_calculator](http://www.epi.org/content/budget_calculator).)

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Appendix A.1: Basic Family Budgets in Pennsylvania by Locale, Family Size and Family Composition  
(1 parent/1 child)

	Housing	Food	Childcare	Transportation	Monthly Healthcare	Other Necessities	Taxes	Total	Annual Total
Allentown-Bethlehem-Easton FMR area	\$816	\$317	\$709	\$339	\$210	\$272	\$430	\$3,094	\$37,124
Altoona	\$581	\$317	\$709	\$343	\$210	\$216	\$298	\$2,674	\$32,090
Armstrong County Metro FMR area	\$546	\$317	\$709	\$343	\$210	\$208	\$253	\$2,586	\$31,027
Erie	\$631	\$317	\$709	\$298	\$210	\$228	\$311	\$2,705	\$32,462
Harrisburg—Carlisle	\$722	\$317	\$709	\$339	\$210	\$250	\$385	\$2,932	\$35,182
Johnstown	\$546	\$317	\$709	\$343	\$210	\$208	\$266	\$2,599	\$31,187
Lancaster	\$715	\$317	\$709	\$298	\$210	\$248	\$368	\$2,866	\$34,388
Lebanon	\$643	\$317	\$709	\$343	\$210	\$231	\$382	\$2,834	\$34,014
Philadelphia-Camden-Wilmington	\$932	\$317	\$709	\$277	\$210	\$300	\$634	\$3,380	\$40,561
Pike County	\$923	\$317	\$709	\$343	\$210	\$298	\$461	\$3,261	\$39,132
Pittsburgh	\$666	\$317	\$709	\$318	\$210	\$236	\$368	\$2,825	\$33,901
Reading	\$715	\$317	\$709	\$298	\$210	\$248	\$396	\$2,895	\$34,735
Rural	\$598	\$317	\$691	\$390	\$222	\$220	\$335	\$2,773	\$33,279
Scranton—Wilkes-Barre	\$627	\$317	\$709	\$339	\$210	\$227	\$403	\$2,833	\$33,990
Sharon	\$583	\$317	\$709	\$343	\$210	\$216	\$291	\$2,670	\$32,038
State College	\$788	\$317	\$709	\$343	\$210	\$266	\$450	\$3,083	\$36,994
Williamsport	\$587	\$317	\$709	\$343	\$210	\$217	\$295	\$2,678	\$32,141
York—Hanover	\$713	\$317	\$709	\$298	\$210	\$248	\$367	\$2,862	\$34,347

**Appendix A.2: Basic Family Budgets in Pennsylvania by Locale, Family Size and Family Composition**  
 (1 parent/2 children)

	Housing	Food	Childcare	Monthly				Taxes	Total	Annual Total
				Transportation	Healthcare	Other Necessities				
Allentown-Bethlehem-Easton FMR area	\$816	\$465	\$1,096	\$339	\$289	\$308	\$437	\$3,749	\$44,992	
Altoona	\$581	\$465	\$1,096	\$343	\$289	\$251	\$328	\$3,352	\$40,228	
Armstrong County Metro FMR area	\$546	\$465	\$1,096	\$343	\$289	\$243	\$304	\$3,285	\$39,419	
Erie	\$631	\$465	\$1,096	\$298	\$289	\$263	\$334	\$3,377	\$40,521	
Harrisburg—Carlisle	\$722	\$465	\$1,096	\$339	\$289	\$285	\$387	\$3,583	\$42,997	
Johnstown	\$546	\$465	\$1,096	\$343	\$289	\$243	\$317	\$3,298	\$39,580	
Lancaster	\$715	\$465	\$1,096	\$298	\$289	\$284	\$370	\$3,517	\$42,200	
Lebanon	\$643	\$465	\$1,096	\$343	\$289	\$266	\$396	\$3,498	\$41,974	
Philadelphia-Camden-Wilmington	\$932	\$465	\$1,096	\$277	\$289	\$336	\$672	\$4,067	\$48,804	
Pike County	\$923	\$465	\$1,096	\$343	\$289	\$334	\$459	\$3,908	\$46,899	
Pittsburgh	\$666	\$465	\$1,096	\$318	\$289	\$272	\$379	\$3,485	\$41,818	
Reading	\$715	\$465	\$1,096	\$298	\$289	\$284	\$406	\$3,553	\$42,631	
Rural	\$598	\$465	\$1,040	\$390	\$303	\$255	\$328	\$3,379	\$40,554	
Scranton—Wilkes-Barre	\$627	\$465	\$1,096	\$339	\$289	\$262	\$426	\$3,503	\$42,042	
Sharon	\$583	\$465	\$1,096	\$343	\$289	\$252	\$320	\$3,347	\$40,167	
State College	\$788	\$465	\$1,096	\$343	\$289	\$301	\$464	\$3,745	\$44,943	
Williamsport	\$587	\$465	\$1,096	\$343	\$289	\$253	\$322	\$3,354	\$40,248	
York—Hanover	\$713	\$465	\$1,096	\$298	\$289	\$283	\$369	\$3,513	\$42,160	

Appendix A.3: Basic Family Budgets in Pennsylvania by Locale, Family Size and Family Composition  
(2 parent/1 child)

						Monthly								
						Housing	Food	Childcare	Transportation	Healthcare	Other Necessities	Taxes	Total	Annual Total
Allentown-Bethlehem-Easton FMR area		\$816	\$514	\$709	\$482	\$286	\$320	\$473	\$3,600	\$43,198				
Altoona		\$581	\$514	\$709	\$468	\$286	\$263	\$365	\$3,185	\$38,225				
Armstrong County Metro FMR area		\$546	\$514	\$709	\$468	\$286	\$255	\$341	\$3,118	\$37,420				
Erie		\$631	\$514	\$709	\$404	\$286	\$275	\$364	\$3,182	\$38,190				
Harrisburg—Carlisle		\$722	\$514	\$709	\$482	\$286	\$297	\$432	\$3,442	\$41,303				
Johnstown		\$546	\$514	\$709	\$468	\$286	\$255	\$354	\$3,131	\$37,571				
Lancaster		\$715	\$514	\$709	\$404	\$286	\$295	\$397	\$3,320	\$39,837				
Lebanon		\$643	\$514	\$709	\$468	\$286	\$278	\$428	\$3,326	\$39,910				
Philadelphia-Camden-Wilmington		\$932	\$514	\$709	\$401	\$286	\$347	\$696	\$3,885	\$46,616				
Pike County		\$923	\$514	\$709	\$468	\$286	\$345	\$494	\$3,739	\$44,866				
Pittsburgh		\$666	\$514	\$709	\$447	\$286	\$284	\$413	\$3,318	\$39,815				
Reading		\$715	\$514	\$709	\$404	\$286	\$295	\$431	\$3,354	\$40,242				
Rural		\$598	\$514	\$691	\$524	\$308	\$267	\$389	\$3,291	\$39,489				
Seranton—Wilkes-Barre		\$627	\$514	\$709	\$482	\$286	\$274	\$463	\$3,355	\$40,260				
Sharon		\$583	\$514	\$709	\$468	\$286	\$264	\$357	\$3,181	\$38,166				
State College		\$788	\$514	\$709	\$468	\$286	\$313	\$492	\$3,569	\$42,830				
Williamsport		\$587	\$514	\$709	\$468	\$286	\$265	\$359	\$3,187	\$38,249				
York—Hanover		\$713	\$514	\$709	\$404	\$286	\$295	\$396	\$3,316	\$39,795				

Appendix A.4: Basic Family Budgets in Pennsylvania by Locale, Family Size and Family Composition  
(2 parent/2 children)

	Monthly										Annual Total
	Housing	Food	Childcare	Transportation	Healthcare	Other Necessities	Taxes	Total			
Allentown-Bethlehem-Easton FMR area	\$816	\$643	\$1,096	\$482	\$364	\$351	\$472	\$4,225	\$50,697		
Altoona	\$581	\$643	\$1,096	\$468	\$364	\$294	\$373	\$3,820	\$45,839		
Armstrong County Metro FMR area	\$546	\$643	\$1,096	\$468	\$364	\$286	\$348	\$3,751	\$45,016		
Erie	\$631	\$643	\$1,096	\$404	\$364	\$306	\$372	\$3,817	\$45,804		
Harrisburg—Carlisle	\$722	\$643	\$1,096	\$482	\$364	\$328	\$431	\$4,067	\$48,801		
Johnstown	\$546	\$643	\$1,096	\$468	\$364	\$286	\$363	\$3,767	\$45,200		
Lancaster	\$715	\$643	\$1,096	\$404	\$364	\$327	\$400	\$3,948	\$47,380		
Lebanon	\$643	\$643	\$1,096	\$468	\$364	\$309	\$439	\$3,963	\$47,551		
Philadelphia-Camden-Wilmington	\$932	\$643	\$1,096	\$401	\$364	\$379	\$726	\$4,541	\$54,488		
Pike County	\$923	\$643	\$1,096	\$468	\$364	\$377	\$485	\$4,356	\$52,267		
Pittsburgh	\$666	\$643	\$1,096	\$447	\$364	\$315	\$420	\$3,951	\$47,412		
Reading	\$715	\$643	\$1,096	\$404	\$364	\$327	\$440	\$3,989	\$47,867		
Rural	\$598	\$643	\$1,040	\$524	\$388	\$298	\$379	\$3,871	\$46,452		
Scranton--Wilkes-Barre	\$627	\$643	\$1,096	\$482	\$364	\$305	\$481	\$3,999	\$47,992		
Sharon	\$583	\$643	\$1,096	\$468	\$364	\$295	\$364	\$3,813	\$45,761		
State College	\$788	\$643	\$1,096	\$468	\$364	\$344	\$497	\$4,201	\$50,408		
Williamsport	\$587	\$643	\$1,096	\$468	\$364	\$296	\$366	\$3,820	\$45,841		
York--Hanover	\$713	\$643	\$1,096	\$404	\$364	\$326	\$399	\$3,945	\$47,339		